TECHNICAL REVIEW REMARKS

REMARK NUMBER	REMARKS	RECVD BY
1.	On November 21, 1995, Transwestern Pipeline Company submitted a minor revision application for the installation of a single Sivalls IH-4810 heater/boiler. The heater will be used solely for evaporating water at the compressor stations that has been collected and run through an oil/water separator. Copies of this minor revision application will be made and placed with the Class I application. This new heater/boiler will be included in the Class I permit.	AH1
2.	A.A.C. R18-2-101.61.c. defines a major stationary source as a source "that directly emits or has the potential to emit, 100 tpy or more of any air pollutant". Transwestern's Flagstaff compressor station is a major source.	AH1
3.	Operating Permit No. 0383-95 requires the permittee to conduct performance tests for NO _x 30 days before the expiration date of the permit. Performance test was conducted on 12th and 13th of December, 1995. Source was found to be in compliance.	AH1
4.	It can be demonstrated that the particulate emissions standard will not be exceeded by EPNs 201, 202, 203, 221, 222, and HTR-1 by showing that the particulate matter Potential To Emit (PTE) is less than the maximum allowable particulate matter standard. The maximum allowable particulate matter standard for the Flagstaff compressor station is determined using the process weight rate equations of A.A.C. R18-2-719.C.1. and A.A.C. R18-2-724.C.1. and the total heat input from EPNs 201, 202, 203, 221, 222, and HTR-1. The maximum allowable particulate matter standard is 186.1 ton/year (TPY). The particulate matter Potential To Emit (PTE) is calculated using emission factors and is 3.83 TPY. Since the PTE is less than the maximum allowable particulate matter standard, the particulate matter standard will not be exceeded. Refer to Field Activity Report No. OAQ-NRO-2319. The opacities from the three engines were essentially zero.	AH1

TECHNICAL REVIEW REMARKS

REMARK NUMBER	REMARKS	RECVD BY
5.	The requirement for the permittee to submit compliance certifications on March 31st and September 30th of each year has been included in Attachment "A" of permit no. 1000155. Refer to Section VII of Attachment A.	AH1
6.	The Flagstaff compressor station was constructed in 1967. This was constructed prior to New Source Review and the development of the ADEQ program. This source was issued an Operating Permit No. 0383-95 on November 25, 1992 and there were no construction requirements in this operating permit. On November 21, 1995, Transwestern Pipeline Company submitted a minor permit revision application for the installation of a single Sivalls IH-4810 heater/boiler. This minor permit revision number 1000294 was issued on March 7, 1996.	AH1
7.	The compressors and generators have air to fuel ratio controllers which are used to optimize fuel economy and emissions. The compressors are currently running lean in order to control No_x . Although there are no air pollution control devices, the source is still in compliance as indicated by the performance test.	AH1
8.	No excess emission reports have been filed by the permittee. Emission Inventory questionnaires have been submitted. The source submitted a compliance certification in their Class I application. Based on Field Activity Report No. 14408, performance tests were conducted and the Flagstaff compressor station is in compliance.	AH1
9.	This is not a major source of non-point source emissions. Experience has proven that the non-point source emissions are not large enough to cause an exceedance of the 40% opacity limit of Article 6.	AH1
10.	Refer to Sections II and III of Attachment B.	AH1

PERMIT NO. 1000155 GENERAL DISCUSSION AND SUPPORTING INFORMATION

General Comments

Transwestern Pipeline Company (TPC) provides natural gas transportation services for natural gas suppliers, and owns and operates a large natural gas pipeline network. The Flagstaff Compressor Station is one of several such stations that provide natural gas compression to the pipeline network. Compression is needed to maintain enough pressure in the pipeline to keep the natural gas flowing.

Compression is accomplished at the Flagstaff station by three natural gas-fired turbo-charged reciprocating engines each driving a compressor unit. Two natural gas-fired naturally aspirated reciprocating engines power two generators which provide electricity to the compressor station. One water bath in-line natural gas-fired heater is to be used for evaporating water that was collected and run through an oil/water separator. There are no air pollution control equipment installed on these engines at the Flagstaff Compressor Station. The facility is permitted to operate 365 days, 24 hours a day. The primary pollutants present in the stack gases resulting from combustion of natural gas is NOx. Sulfur dioxide, carbon monoxide, and VOCs are present in trace quantities in the stack gases. Other equipment on site include ten storage tanks, valves, flanges, compressor seals, and relief valves and emissions from these units are mainly trace amounts of VOCs.

Regulatory History

Though the Flagstaff station is operating for some time now, the first air quality permit was issued to them in 1992. The permit number is 0383-95. The most relevant conditions of this permit are:

- 1. Permittee shall operate in accordance with A.A.C. R18-2-702 and 719.
- 2. Permittee shall conduct performance test on the engine stacks 30 days before expiration of the permit. The performance tests were to quantify NOx emissions.
- 3. Permittee is permitted to burn only natural gas.
- 4. Visible emissions shall have opacity lesser than 40%.

On November 21, 1995, Transwestern Pipeline Company submitted a minor revision application for the installation of a single Sivalls IH-4810 heater/boiler. The minor revision number 1000294 was issued on March 7, 1996. The most relevant conditions of this permit are:

- 1. Permittee shall operate the Sivalls heater in accordance with A.A.C. R18-2-702 and 724.
- 2. Permittee shall not allow emission of particulates from the Sivalls heater in excess of limit established in A.A.C. R18-2-724.C.1.
- 3. Visible emissions from the heater shall have opacity lesser than 40%.
- 4. Permittee shall burn only natural gas as fuel for the Sivalls heater.

The performance test was conducted on the stacks of the three Dresser-Rand reciprocating engines on December 12 and 13, 1995. The source was found to be in compliance. Refer to Field Activity Report No. 14408 for further detail. There have been no recorded violations of any permit conditions.

Emissions

1. Test Data

Results of the performance tests on the Dresser-Rand reciprocating engines on 12th and 13th of December, 1995 are shown in the following table. The tests on all three units were conducted at 100% load.

Pollutant	Unit I	Unit II	Unit III
NOx	(96.8 #/hr)(4.38) = 424 tpy	(87.5 #/hr)(4.38) = 383.2 tpy	(98.3 #/hr)(4.38) = 430.5 tpy
CO	(11.6 #/hr)(4.38) = 50.8 tpy	(11.7 #/hr)(4.38) = 51.2 tpy	(11.2 #/hr)(4.38) = 49.0 tpy
VOCs	(0.0402 #/hr)(4.38) = 0.18 tpy	(0.037 #/hr)(4.38) = 0.16 tpy	(0.040 #/hr)(4.38) = 0.17 tpy

2. Emission Factors

Criteria pollutant and total hydrocarbons emissions *per engine* were calculated below using AP-42 factors from the 1/95 (fifth edition), Table3.2-2.

NOx: (4000 hp)(0.026 lb/hp-hr)(4.38) = 455.5 tpy

 SO_2 : (2.857 lb/MMScf)(0.0249 Mmscf/hr)(4.38) = 0.31 tpy

CO: (4000 hp)(0.00353 lb/hp-hr)(4.38) = 61.8 tpyVOC: (4000 hp)(0.00159 lb/hp-hr)(4.38) = 27.9 tpy

Discussion

The above data shows that the emission calculations submitted by TPC in their Title V permit application for the Flagstaff station exceeds the emissions levels measured during the performance test. The result shows that the Flagstaff station is a major source for CO and NOx.

The emissions inventory (EI) for the year 1994 submitted by the source to ADEQ reported emissions of 444.48 tpy of NOx, 382.5 tpy of CO, 0.10 tpy of SO₂, and 7.53 tpy of VOCs. The EI for the year 1995 reported 137.94 tpy of NOx, 118.63 tpy of CO, 3.62 tpy of VOCs and 0.03 tpy of SO₂.

Permit Contents: Attachment B

The three turbo-charged Dresser-Rand reciprocating engines are each rated at 4000 hp (name plate). Each engine is equipped with air-fuel ratio controller. The two Waukesha generator engines rated at 451 hp were installed in 1967. These engines are not subject to any of the New Source Performance Standards (NSPS). The state rule that covers gas turbine operations is *R18-2-719*: *Standards of performance for existing stationary rotating machinery*. This state rule considers emissions of three pollutants (i) particulate matter, (ii) visible emissions, and (iii) sulfur dioxide. There is no reference to NOx or CO emissions. The Sivalls in-line water heater rated at 1 MMBtu/hr was installed in 1996 and is subject to R18-2-724: *Standards of Performance for Fossil-Fuel Fired Industrial and Commercial Equipment*.

Emission Limits/Standards

A. Turbo-charged and Naturally Aspirated Reciprocated Engines and Sivalls In-line Water Heater

Natural gas combustion results in negligible particulate matter emissions. The maximum particulate matter emission from the engines is 3.83 tpy and the maximum allowable particulate matter imposed by R18-2-719.C and R18-2-724.C is 186.1 tpy. The operating permit requires TPC to combust only natural gas for engine operations.

The sulfur standard in R18-2-719.F refers to low sulfur *oils*, therefore this standard is not applicable to natural gas combustion. R-18-2-719.I and 719.J require recordkeeping requirements for fuel sulfur quantity. These requirements support the aforementioned sulfur standard, and as such are not applicable to natural gas combustion. A similar argument holds true for non-applicability of state rules A.A.C.R18-2-724.E, 724.F, and 724.H. These are for sulfur oil and coal fired equipment.

State rule A.A.C. R18-2-724.I states that the permittee shall install, calibrate, maintain and operate a continuous monitioring system for measurement of opacity of emissions discharged into the atmosphere from the control device. Visible emissions from combustion of natural gas are low. There is no control device on the water heater. Therefore, this requirement is not applicable. The current SIP defines stationary rotating machinery as "any gas engine, diesel engine, gas turbine, or oil fired turbine operated from a stationary mounting and used for the production of electric power or for the direct drive for other equipment". The reciprocating engines qualify as stationary rotating machinery. The visible emissions standard, R18-2-719.E imposes a 40% opacity limitation from the engines. State rule A.A.C. R18-2-724.J requires reports of excess emissions and requires reports of all six-minute periods in which the opacity of any plume or effluent from the inline heater exceeds 15 percent. This 15 percent is also the maximum allowable opacity from the heater. This has been included in the permit.

B. Non-point Sources

The standards in Article 6 are applicable requirements for non-point sources. The following sources will be monitored:

- 1. Driveways, parking areas, vacant lots
- 2. Unused open areas
- 3. Open areas (Used, altered, repaired, etc.)
- 4. Construction of roadways
- 5. Material transportation

All of these areas must comply with the opacity limitation of 40%. The control measures for these sites include gravel for driveways(1) and native vegetation for unused open areas(2). Most of the other sources require control measures of dust suppressants and/or wetting agents(3-5).

When instances of open burning may occur, the condition in the permit directs TPC to obtain a permit from ADEQ, or the local officer in charge of issuing burn permits.

Monitoring and Recordkeeping Requirements

A. Turbo-charged and Naturally Aspirated Reciprocating Engines

As noted in the preceding discussion under emission limits and standards above, natural gas combustion results in minimal particulate matter emissions. The maximum potential to emit from the engines and inline heater is 3.83 tpy. The maximum allowable particulate matter emission under state rules A.A.C. R18-2-719.C and R18-2-724.J is 186.1 tpy. The PTE is a mere 2.06% of the allowable limit. Hence, monitoring, recordkeeping, and testing of particulate matter emissions are not required in the permit.

"Pipeline-quality" natural gas has to conform to standards approved by the Federal Energy Regulatory Commission (FERC). Compressor stations which supply pipeline quality natural gas are subject to the FERC standards for sulfur content and heating value of fuel. The FERC standard is usually more stringent than the state rule with respect to sulfur content. One of the FERC standards limits the sulfur content in the gas to less than 0.75 grains/100 scf (equivalent to 0.0026 weight percent of sulfur). Another standard specifies that the heating value be greater than or equal to 970 Btu per cubic foot. State rule A.A.C. R18-2-719.I requires recording the sulfur content and the lower heating value of the fuel being fired. TPC runs the reciprocating engines with fuel drawn from their pipeline. Maintaining a copy of FERC approved Tariff agreement on-site could then be construed as denoting compliance with R18-2-719.I. State rule A.A.C. R18-2-719.J requires reporting cases when the sulfur content of the fuel being fired exceeds 0.8 percent by weight. FERC approved tariff assures sulfur content less than 0.0026 percent by weight. This is 0.325% of the allowable (reporting) limit in the state rule A.A.C. R18-2-719.J. Thus maintaining a copy of the FERC approved Tariff agreement on-site would be an adequate means of complying with the monitoring requirements for the particulate, opacity and fuel use standards. Performance testing on the engines and inspection for visible emissions of the source have indicated that the source is in compliance.

The source is being required to monitor the dates and the number of hours of operation of the reciprocating engines.

B. Non-point Sources

In order to have continuous compliance, the source has been required to maintain control measures or apply control measures as may be appropriate depending on the kind of activity performed and maintain a copy of these. For example, parking lots and vacant areas are already 99.9% paved or graveled at the site. The permit requires the Permittee to maintain gravel (add gravel in case gravel is crushed) and also maintain the date of graveling. In case of some earth excavation and/or roadway reconstruction/reparation, the permit requires the Permittee to use wetting agent and record the activity performed, the date the activity was performed and the control measure adopted. In case of transporting material capable of giving rise to airborne dust, the permit requires the Permittee to use covering, wetting agents, and/or dust suppresants. The permit also requires the permittee to record the activity performed, the date the activity was performed and the control measure adopted. Also, monitoring requirements for the applicable open burning rule may be satisfied by keeping all open burn permits on file.

Reporting Requirments

The source is been required to report any change in the FERC approved tariff agreement relating to sulfur content and lower heating value limits. The source is also required to report all six-minute periods in which the opacity of any plume from the inline heater exceeds 15%. The source is also required to report the dates of operation and the hours of operation of each reciprocating engine.

Testing Requirements

The source has been required to conduct or cause to be conducted performance test on all its reciprocating engine for nitrogen oxides and carbon monoxide. The permittee has been required to conduct this performance test within six months of this permit expiration on a reciprocating engine if the cumulative days of operation of the engine exceed fifteen days during the course of the permit. This would serve as a data point in time for PSD/NSR review purposes.

Permit Contents: Attachment "E"

Insignificant Activities:

Tanks numbered 1-8 at the site are not subject to any of the requirements in the A.A.C. R18-2-710, Standards of Performance for Existing Storage Vessels for Pertoleum Liquids.

Petroleum Liquids, as defined in A.A.C. R18-2-701.21, means "petroleum, condensate, and any finished or intermediate products manufactured inpetroleum refinery..." The source under consideration is a compressor station and hence does not fall under its applicability.

The tanks are also not subject to Subpart K and Ka for similar reason. Only three tanks (Tank 2,6,and 7) have capacities above 40 m³. Tanks 2 and 7 fall out of applicability of Subpart Kb because they were installed before July 23, 1984. Tank 6 contains oily wastewater (95% water) and is not volatile and falls out of applicability of Subpart Kb.

The Transwestern Pipeline Company operates its Flagstaff Compressor Station under a tariff approved by the Federal Energy Regulatory Commission (FERC) that establishes specifications for the sulfur content of natural gas

received into the pipeline. The tariff limits the total sulfur content in the pipeline natural gas to 0.75 grains/100 scf. A weight percent of sulfur in Transwestern's natural gas has been calculated under Section III of the "Emission Calculation Verification". The weight percent was calculated to be 0.0026. Because of the low sulfur content of the natural gas fuel burned by the equipment at the Flagstaff Compressor Station, the requirements of A.A.C. R18-2-719.I. and A.A.C. R18-2-719.J. are fulfilled in the permit by the following conditions:

- A. The permittee shall comply with the requirements of A.A.C. R18-2-719.I. by maintaining a copy of the FERC approved Tariff agreement that places limits on the sulfur content and heating value of the natural gas received by Transwestern Pipeline Company;
- B. The permittee shall comply with the requirements of A.A.C. R18-2-719.J. by maintaining a copy of the FERC approved Tariff agreement that places limits on the sulfur content and heating value of the natural gas received by Transwestern Pipeline Company; and
- C. The permittee will also be required to notify the Director in writing within 30 days of any changes to the Tariff agreement that occurs during the term of the permit. Changes to the Tariff agreement may require a revision to the permit.

In the Class I application it says that the two Waukesha LRZ F3520 GU auxiliary engines were inadvertently omitted from the application for permit number 0383-95. These engines are subject to A.A.C. R18-2-719 and have been included in permit number 1000155. The addition of these engines does not constitute a revision to operating permit number 0383-95, because they were installed when the facility was initially constructed in 1967.

REMARK NUMBER	REMARKS	RECVD BY
12. cont.	Insignificant Activities, Continued:	AH1
	C. Tank No. 3 (Used Oil; 3,150 gal; installed in 1966; True Vapor Pressure = 0.00006 psia)	
	1. Tank No. 3 is not subject to Subparts K and Ka of 40 CFR 60 because its storage capacity is less than 40,000 gallons. It is not subject to Subpart Kb of 40 CFR 60 because it was installed before July 23, 1984 and its storage capacity is less than 40 m ³ .	
	2. Tank No. 3 is not subject to A.A.C. R18-2-710.A. because it's storage capacity is less than 40,000 gallons. Tank No. 3 is not subject to A.A.C. R18-2-710.E.2.a. because the True Vapor Pressure is not greater than 0.5 psia and less than 1.5 psia. Tank No. 3 is not subject to A.A.C. R18-2-710.E.2.b. because the True Vapor Pressure is not greater than 9.1 psia. Tank No. 3 is not subject to A.A.C. R18-2-710.C.	
	Tank No. 3 is subject to A.A.C. R18-2-710.B, 710.D., and 710.E.1.	
	3. A.A.C. R18-2-101.54 says that an Insignificant Activity is " an activity in an emissions unit that is not otherwise subject to any applicable requirement" Since Tank No. 3 is subject to A.A.C. R18-2-710.b, 710.D., and 710.E.1., Tank No. 3 is not an insignificant activity.	

TECHNICAL REVIEW REMARKS

REMARK NUMBER			REMARKS	RECVD BY
12. cont.	Insigni	ficant Activities,	Continued:	AH1
	D.	Tank No. 4	(Ethylene Glycol; 5,040 gal; installed in 1966; True Vapor Pressure = 0.001 psia)	
		condensate, of tured in a pet condensate, of petroleum refit No. 4 is not so	2-701.21. defines a petroleum liquid as a "petroleum, and any finished or intermediate products manufacroleum refinery" Ethylene Glycol is not a petroleum, r any finished or intermediate product manufactured in a nery. Ethylene Glycol is an antifreeze. Therefore, Tank ubject to 40 CFR 60 Subparts K, Ka, Kb and A.A.C. Tank No. 4 is an insignificant activity.	
	E.	Tank No. 5	(Ethylene Glycol; 3,150 gal; installed in 1966; True Vapor Pressure = 0.001 psia)	
		Same as 12.D	above. Tank No. 5 is an insignificant activity.	
	F.	Tank No. 6	(Oily Water; 8,820 gal; installed in 1988; True Vapor Pressure = NA)	
		becaus not sul	No. 6 is not subject to Subparts K and Ka of 40 CFR 60 se its storage capacity is less than 40,000 gallons. It is bject to Subpart Kb of 40 CFR 60 because its storage ity is less than 40 m ³ .	
			No. 6 is not subject to A.A.C. R18-2-710 for the same as as 12.D. above except oily water is not a petroleum	
		3. Tank I	No. 6 is an insignificant activity.	

TECHNICAL REVIEW REMARKS

REMARK NUMBER		REMARKS	RECVD BY
12. cont.	G.	Tank No. 7 (Oily Water; 16,800 gal; installed in 1979; True Vapor Pressure = NA)	AH1
		1. Tank No. 7 is not subject to Subparts K and Ka of 40 CFR 60 because its storage capacity is less than 40,000 gallons. It is not subject to Subpart Kb of 40 CFR 60 because it was manufactured before July 23, 1984.	
		2. Tank No. 7 is not subject to A.A.C. R18-2-710 for the same reasons as 12.D. above except oily water is not a petroleum liquid.	
		3. Tank No. 7 is an insignificant activity.	
	H.	Tank No.s 8 (Condensate; 23,100 gal; installed in 1979; True Vapor Pressure = NA)	
		1. Condensate is formed from two different processes. The first process involves the removal of water vapor from the natural gas line by using a scrubber. The second process involves the removal of water that has collected inside the pipeline. This water is removed using a circular plug that is pulled through the pipeline.	
		2. Tank No. 8 is not subject to A.A.C. R18-2-710 and Subparts K and Ka of 40 CFR 60 for the same reasons as 12.D. above except condensate is not a petroleum liquid. It is also not subject to Subpart Kb of 40 CFR 60 because it was manufactured before July 23, 1984.	
		3. Tank No. 8 is an insignificant activity.	

TECHNICAL REVIEW REMARKS

REMARK NUMBER		REMARKS	RECVD BY
12. cont.	I. '	Tank No. 9 (Condensate; 1,260 gal; installed in 1976; True Vapor Pressure = NA)	AH1
		1. Condensate is formed from two different processes. The first process involves the removal of water vapor from the natural gas line by using a scrubber. The second process involves the removal of water that has collected inside the pipeline. This water is removed using a circular plug that is pulled through the pipeline.	
	2	2. Tank No. 9 is not subject to A.A.C. R18-2-710 and Subparts K and Ka of 40 CFR 60 for the same reasons as 12.D. above except condensate is not a petroleum liquid. It is also not subject to Subpart Kb of 40 CFR 60 because it was manufactured before July 23, 1984.	
	í	3. Tank No. 9 is an insignificant activity.	
	J. ,	Tank No. 10 (Diesel Fuel; 42,000 gal; installed in 1992; True Vapor Pressure = 0.009 psia)	
		1. Tank No. 10 is not subject to A.A.C. R18-2-710 because diesel is exempted from the definition of a "petroleum liquid" under A.A.C. R18-2-701.21. Tank No. 10 is not subject to Subpart K of 40 CFR 60 because it was manufactured after May 19, 1978. Tank No. 10 is not subject to Subpart Ka of 40 CFR 60 because it was manufactured after July 23, 1984.	

TECHNICAL REVIEW REMARKS

REMARK NUMBER	REMARKS	RECVD BY
12. cont.	Insignificant Activities, Continued:	AH1
	J. Tank No. 10, continued:	
	2. Tank No. 10 is subject to Subpart Kb of 40 CFR 60. However, the only applicable section of 40 CFR 60 is 60.116b(a) and 60.116b(b).	
	3. A.A.C. R18-2-101.54 says that an Insignificant Activity is " an activity in an emissions unit that is not otherwise subject to any applicable requirement" Since Tank No. 10 is subject to Subpart Kb of 40 CFR 60, Tank No. 10 is not an insignificant activity.	
13.	There are no conditions in this permit that are subject to A.A.C. R18-2-331 "Material Permit Conditions".	AH1
14.		AH1

TECHNICAL REVIEW REMARKS

REMARK NUMBER	REMARKS	RECVD BY
14. cont.		AH1
15.		AH1
16.	In operating permit number 0382-95 it says that they have three operating Ingersol Rand KVT-616 compressor engines. On December 11, 1995 I talked to Larry Campbell of Transwestern to find out why the operating permit says that the compressor engines were made by Ingersol and the Class I application says they are made by Dresser. He said that Dresser had bought out Ingersol.	AH1
17.		AH1

TECHNICAL REVIEW REMARKS

REMARK NUMBER	REMARKS	RECVD BY
18.	I faxed and mailed a letter to Larry Campbell on December 13, 1995 requesting that they submit an amendment to their application which includes the applicable regs and emissions for the heater/boiler. I also faxed a copy of this letter to Dave Baker (505-294-9943) of Team Environmental. I gave them until January 15, 1996 to submit this information. The permit engineer will need to review this information when ADEQ receives it.	АН1
19.	I faxed and mailed a letter to Larry Campbell on December 13, 1995 requesting that they submit emissions an amendment to their application which includes the emissions for Tank No.s 1, 2, 3, and 10. I also faxed a copy of this letter to Dave Baker (505-294-9943) of TeamEnvironmental. I gave them until January 15, 1996 to submit this information. The permit engineer will need to review this information when ADEQ receives it.	АН1
20.	Finish deviation, Section XII	AH1
21.	I talked to Larry Campbell on December 13, 1995 and he said that the diesel fuel tank is used to supply fuel to an on-site front end loader which is used to clean the roads during the winter. I have added conditions from Article 8 of the A.A.C. to cover this piece of equipment.	АН1
22.	Need to find out what the equipment id # is for this heater!	AH1